

WHAT IS CLAIMED IS:

1 1. An isolated nucleic acid molecule, comprising a
2 sequence encoding a BT toxin receptor of about 200 kD from
3 the pink bollworm, *Pectinophora gossypiella*.

1 2. The isolated nucleic acid molecule of claim 1,
2 encoding the BT toxin receptor sequence of SEQ ID NO: 2.

1 3. The isolated nucleic acid molecule of claim 1,
2 comprising the sequence of SEQ ID NO: 1.

1 4. The isolated nucleic acid molecule of claim 1,
2 wherein said isolated nucleic acid molecule is capable of
3 hybridizing at high stringency to a probe of 400 contiguous
4 nucleotides of SEQ ID NO: 1 over the entire length of said
5 probe.

1 5. The isolated nucleic acid molecule of claim 1,
2 wherein said BT toxin receptor is at least 85% homologous to
3 the sequence of SEQ ID NO: 2.

1 6. The isolated nucleic acid molecule of claim 1,
2 wherein said BT toxin receptor is at least 90% homologous to
3 the sequence of SEQ ID NO: 2.

1 7. The isolated nucleic acid molecule of claim 1,
2 wherein said BT toxin receptor is at least 95% homologous to
3 the sequence of SEQ ID NO: 2.

1 8. The isolated nucleic acid molecule of claim 1,
2 wherein said BT toxin receptor is at least 98% homologous to
3 the sequence of SEQ ID NO: 2.

1 9. The isolated nucleic acid molecule of claim 1,
2 wherein the sequence is codon optimized for expression in a
3 prokaryotic system.

1 10. The isolated polynucleotide sequence of claim 1
2 wherein the sequence is codon optimized for expression in a
3 eukaryotic system.

1 11. An expression vector, comprising the isolated
2 nucleic acid molecule of claims 1-10.

Patent Application
Docket #48279-4

1 12. A host cell, comprising the vector of claim 11.

1 13. The host cell of claim 12, which is used to assess
2 the level of cytotoxicity and mode of action of toxins.

1 14. A cell, comprising a naturally occurring BT toxin
2 receptor, which is used to assess the level of cytotoxicity
3 and mode of action of toxins.

1 15. A transgenic organism, comprising the vector of
2 claim 11.

1 16. An isolated nucleic acid molecule, comprising a
2 sequence encoding a peptide selected from the group
3 consisting of: amino acid (aa) 534-544, aa 291-304, aa 697-
4 705, aa 622-632, aa 886-895, aa 791-803, aa 1055-1066, aa
5 1621-1642, aa 1321-1331, aa 1451-1461, aa 1516-1525, aa 1572-
6 1582, aa 1677-1729, and aa 1269-1367 of SEQ ID NO: 2.

1 17. A purified protein, comprising a sequence that is
2 at least 85% homologous to SEQ ID NO: 2.

Patent Application
Docket #48279-4

1 18. The purified protein of claim 17, wherein the
2 sequence is at least 90% homologous to SEQ ID NO: 2.

1 19. The purified protein of claim 17, wherein the
2 sequence is at least 95% homologous to SEQ ID NO: 2.

1 20. The purified protein of claim 17, wherein the
2 sequence is at least 98% homologous to SEQ ID NO: 2.

1 21. The purified protein of claim 17, wherein the
2 sequence is SEQ ID NO: 2.

1 22. A purified peptide, comprising a sequence selected
2 from the group consisting of; amino acid (aa) 534-544; aa
3 291-304; aa 697-705; aa 622-632; aa 886-895; aa 791-803; aa
4 1055-1066; aa 1621-1642; aa 1321-1331; aa 1451-1461; aa 1516-
5 1525; aa 1572-1582; aa 1677-1729; and aa 1269-1367 of SEQ ID
6 NO: 2.

1 23. The purified peptide of claim 22, that comprises
2 aa 1269-1367 of SEQ ID NO: 2.

1 24. A purified peptide that comprises at least 17
2 contiguous amino acids (aa) from aa 1677-1729 of SEQ ID NO:
3 2.

1 25. An isolated nucleic acid molecule, comprising a
2 first sequence that is capable of hybridizing at high
3 stringency to a probe of a second sequence along said probes
4 entire length, wherein said second sequence is nucleotides
5 3807-4101 of SEQ ID NO: 1.

1 26. An isolated nucleic acid molecule, comprising a
2 sequence that encodes the peptide of claims 19-21.

1 27. *Bacillus thuringiensis* Cry toxin receptor antibody,
2 that binds to an antigen present in the carboxyl tail of a
3 BT-R2 protein as identified in SEQ ID NO: 2, and does not
4 bind to silkworm or tobacco hornworm *Bacillus thuringiensis*
5 Cry toxin receptors.

1 28. A *Bacillus thuringiensis* Cry toxin receptor
2 antibody, that binds to an antigen present in a BT-R2
3 protein as identified in SEQ ID NO: 2, and also binds to

Patent Application
Docket #48279-4

4 silkworm and tobacco hornworm *Bacillus thuringiensis* Cry
5 toxin receptors.